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EXAMINER	
MOORE JR, MICHAEL J	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/735,146	KUMAR ET AL.	
	Examiner	Art Unit	
	Michael J. Moore, Jr.	2619	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 August 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,6-12 and 15-26* is/are rejected.

7)☒ Claim(s) *3-5,13 and 14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I claims (1-26) in the reply filed on 8/10/2007 is acknowledged.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 12/12/2003 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Specification

3. The disclosure is objected to because of the following informalities: On page 2, line 23, the word "If" should be "In". Also, on page 7, line 4, the word "check" should be "checks". Appropriate correction is required.

Claim Objections

4. Claims **7, 14, 15, and 25** are objected to because of the following informalities:

Regarding claim **7**, an objection is made to the use of the word "can" on line 2. This word constitutes optional language that does not further limit this claim. Specifically, it is not known whether the limitations following this word are necessary or optional.

Regarding claim **14**, an objection is made to the claimed variable "M" on line 1. Specifically, it is unclear how the variable "M" is related to the "current dequeue slot" and "last enqueued slot" of claim **9**. It is believed that this claim should rather depend on claim **13** in order to clarify this relationship.

Regarding claim **15**, an objection is made to the use of the word "can" on line 2. This word constitutes optional language that does not further limit this claim. Specifically, it is not known whether the limitations following this word are necessary or optional.

Regarding claim **25**, an objection is made to the use of the word "can" on line 2. This word constitutes optional language that does not further limit this claim. Specifically, it is not known whether the limitations following this word are necessary or optional.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims **17-26** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, in claims **17-26**, it is unclear what is meant by a "machine-accessible medium" as there is no further explanation of this term in the specification. It is not known what type of medium this constitutes or what type of "machine" is accessing this medium. It is also not known how the medium "provides instructions". Further clarification is needed.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims **1, 2, 7, and 8** are rejected under 35 U.S.C. 102(e) as being anticipated by Fedorkow et al. (U.S. 7,230,917) (hereinafter "Fedorkow"). *Fedorkow* teaches all of the limitations of the specified claims with the reasoning that follows.

Regarding claim **1**, "determining a new enqueue slot of a circular queue having N slots into which a queue element may be enqueued" is anticipated by buffer manager 1010 of Figure 10 that maintains a head pointer 1032 (points to enqueue slot) that is used to load data (queue element) in FIFO 1030 (circular queue having slots) as spoken of on column 15, lines 36-40.

"Determining whether the circular queue is full via executing a check comparing relative positions of the new enqueue slot and a current dequeue slot (CDS)" is anticipated by the buffer manager 1010 of Figure 10 that calculates the depth (fullness) of the FIFO (circular queue) by subtracting the value of the tail pointer 1034 (points to current dequeue slot) from the value of the head pointer 1032 (points to enqueue slot) as spoken of on column 15, lines 40-46.

Lastly, "enqueuing the queue element into the new enqueue slot, if the circular queue is not full" is anticipated by comparator 1050 of Figure 10 that compares the calculated depth with a threshold, and as a result of this comparison showing that the depth is below the threshold (indicates not full), more traffic is accepted for the FIFO

queue (circular queue) as spoken of on column 5, lines 27-31, and column 15, lines 46-49.

Regarding claim **2**, "determining whether enqueuing the queue element into the new enqueue slot would result in an overflow condition of the circular queue via executing the check" is anticipated by comparator 1050 of Figure 10 that compares the calculated depth with a threshold, and as a result of this comparison showing that the depth is above the threshold (indicates full), further traffic is susceptible to overflow as spoken of on column 5, lines 30-34.

Regarding claim **7**, "wherein each of the N slots of the circular queue can buffer multiple queue elements corresponding to multiple logical queues, wherein the queue element corresponds to a particular one of the multiple logical queues, and wherein the new enqueue slot corresponds to the particular one of the multiple logical queues" is anticipated by packet memory 550 of Figure 5 that is organized as a group of queues (multiple logical queues) per output channel as spoken of on column 11, lines 15-20.

Regarding claim **8**, "determining whether enqueuing the queue element into the new enqueue slot of the circular queue would result in an overflow condition of the particular one of the multiple logical queues" is anticipated by comparator 1050 of Figure 10 that compares the calculated depth with a threshold, and as a result of this comparison showing that the depth is above the threshold (indicates full), further traffic is susceptible to overflow as spoken of on column 5, lines 30-34.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claim **6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Fedorkow et al. (U.S. 7,230,917) (hereinafter "Fedorkow") in view of Stiliadis et al. (U.S. 6,134,217) (hereinafter "Stiliadis").

Regarding claim **6**, *Fedorkow* teaches the method of claim **1**. *Fedorkow* does not teach "determining the new enqueue slot according to a pre-sort deficit round robin enqueuing scheme".

However, *Stiliadis* teaches a method a system for packet scheduling using a circular queue where deficit round robin scheduling is utilized as spoken of on column 3, lines 33-38, as well as column 22, lines 29-35.

At the time of the invention, it would have been obvious to someone of ordinary skill in the art, given these references, to combine the deficit round robin scheduling teachings of *Stiliadis* with the teachings of *Fedorkow* in order to provide an effective queuing scheme that allows for variable frame size as spoken of on column 3, lines 33-38 of *Stiliadis*.

12. Claims **9-12, 15-18, 20, 22, 23, 25, and 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fedorkow et al. (U.S. 7,230,917) (hereinafter "Fedorkow") in view of Ellsworth et al. (U.S. 6,131,113) (hereinafter "Ellsworth").

Regarding claim **9**, *Fedorkow* teaches buffer manager 1010 of Figure 10 that maintains a tail pointer 1034 (points to dequeue slot) that is used to retrieve (dequeue) data (queue element) from FIFO 1030 (circular queue having slots) as spoken of on column 15, lines 36-40.

Fedorkow also teaches the adjustment (designation) of buffer pointers as data is loaded and retrieved as spoken of on column 15, lines 38-40, and lines 44-46.

Fedorkow also teaches buffer manager 1010 of Figure 10 that calculates the depth (fullness) of the FIFO (circular queue) by subtracting the value of the tail pointer 1034 (points to current dequeue slot) from the value of the head pointer 1032 (points to enqueue slot) as spoken of on column 15, lines 40-46.

Fedorkow does not teach "setting the LES to the new CDS, if the circular queue is determined to be empty".

However, *Ellsworth* teaches a method of shared resource management where a head pointer and tail pointer are set to a queue starting point indicating an empty queue.

At the time of the invention, it would have been obvious to someone of ordinary skill in the art, given these references, to combine the head and tail pointer teachings of *Ellsworth* with the teachings of *Fedorkow* in order to provide a reset starting point for the head and tail pointers upon the queue becoming empty.

Regarding claim **10**, *Fedorkow* teaches the adjustment (designation) of buffer pointers as data is loaded and retrieved as spoken of on column 15, lines 38-40, and lines 44-46.

Fedorkow does not explicitly teach the incrementing of the CDS pointer to designate the new CDS.

However, *Ellsworth* teaches a method of shared resource management where a tail pointer is incremented in response to an adjustment of shared resources as spoken of on column 7, lines 32-38.

At the time of the invention, it would have been obvious to someone of ordinary skill in the art, given these references, to combine the head and tail pointer teachings of *Ellsworth* with the teachings of *Fedorkow* in order to provide an effective way to keep track of adjustments to a queue.

Regarding claim **11**, *Fedorkow* further teaches buffer manager 1010 of Figure 10 that calculates the depth (fullness) of the FIFO (circular queue) by subtracting the value of the tail pointer 1034 (dequeue count) from the value of the head pointer 1032 (enqueue count) as spoken of on column 15, lines 40-46.

Regarding claim **12**, *Fedorkow* teaches the adjustment (designation) of buffer pointers as data is loaded and retrieved as spoken of on column 15, lines 38-40, and lines 44-46.

Fedorkow does not explicitly teach the incrementing of the dequeue count after dequeuing the queue element from the CDS of the circular queue.

However, *Ellsworth* teaches a method of shared resource management where a tail pointer is incremented in response to an adjustment of shared resources as spoken of on column 7, lines 32-38.

At the time of the invention, it would have been obvious to someone of ordinary skill in the art, given these references, to combine the head and tail pointer teachings of *Ellsworth* with the teachings of *Fedorkow* in order to provide an effective way to keep track of adjustments to a queue.

Regarding claim **15**, *Fedorkow* further teaches packet memory 550 of Figure 5 that is organized as a group of queues (multiple logical queues) per output channel as spoken of on column 11, lines 15-20.

Regarding claim **16**, *Fedorkow* further teaches buffer manager 1010 of Figure 10 that calculates the depth (whether empty) of the FIFO (circular queue) by subtracting the value of the tail pointer 1034 (points to current dequeue slot) from the value of the head pointer 1032 (points to enqueue slot) as spoken of on column 15, lines 40-46.

Regarding claim **17**, *Fedorkow* teaches buffer manager 1010 (machine-accessible medium) of Figure 10.

Fedorkow also teaches buffer manager 1010 of Figure 10 that maintains a tail pointer 1034 (points to dequeue slot) that is used to retrieve (dequeue) data (queue element) from FIFO 1030 (circular queue having slots) as spoken of on column 15, lines 36-40.

Fedorkow also teaches the adjustment (designation) of buffer pointers as data is loaded and retrieved as spoken of on column 15, lines 38-40, and lines 44-46.

Fedorkow also teaches buffer manager 1010 of Figure 10 that calculates the depth (fullness) of the FIFO (circular queue) by subtracting the value of the tail pointer 1034 (points to current dequeue slot) from the value of the head pointer 1032 (points to enqueue slot) as spoken of on column 15, lines 40-46.

Fedorkow does not explicitly teach the incrementing of the CDS pointer to designate a new CDS.

However, *Ellsworth* teaches a method of shared resource management where a tail pointer is incremented in response to an adjustment of shared resources as spoken of on column 7, lines 32-38.

At the time of the invention, it would have been obvious to someone of ordinary skill in the art, given these references, to combine the head and tail pointer teachings of *Ellsworth* with the teachings of *Fedorkow* in order to provide an effective way to keep track of adjustments to a queue.

Regarding claim **18**, *Fedorkow* further teaches the adjustment (designation) of buffer pointers as data is loaded and retrieved as spoken of on column 15, lines 38-40, and lines 44-46. *Fedorkow* further teaches comparator 1050 of Figure 10 that

compares the calculated depth with a threshold, and as a result of this comparison showing that the depth is above the threshold (indicates full), further traffic is susceptible to overflow as spoken of on column 5, lines 30-34.

Regarding claim **20**, *Fedorkow* further teaches buffer manager 1010 of Figure 10 that maintains a head pointer 1032 (points to enqueue slot) that is used to load data (queue element) in FIFO 1030 (circular queue having slots) as spoken of on column 15, lines 36-40.

Regarding claim **22**, *Fedorkow* does not teach "setting the LES pointer to designate the current dequeue slot, if the circular queue is determined to be empty".

However, *Ellsworth* teaches a method of shared resource management where a head pointer and tail pointer are set to a queue starting point indicating an empty queue.

At the time of the invention, it would have been obvious to someone of ordinary skill in the art, given these references, to combine the head and tail pointer teachings of *Ellsworth* with the teachings of *Fedorkow* in order to provide a reset starting point for the head and tail pointers upon the queue becoming empty.

Regarding claim **23**, *Fedorkow* further teaches buffer manager 1010 of Figure 10 that calculates the depth (fullness) of the FIFO (circular queue) by subtracting the value of the tail pointer 1034 (dequeue count) from the value of the head pointer 1032 (enqueue count) as spoken of on column 15, lines 40-46.

Regarding claim **25**, *Fedorkow* further teaches packet memory 550 of Figure 5 that is organized as a group of queues (multiple logical queues) per output channel as spoken of on column 11, lines 15-20.

Regarding claim **26**, *Fedorkow* further teaches buffer manager 1010 of Figure 10 that calculates the depth (whether empty or full) of the FIFO (circular queue) by subtracting the value of the tail pointer 1034 (points to current dequeue slot) from the value of the head pointer 1032 (points to enqueue slot) as spoken of on column 15, lines 40-46.

13. Claim **21** is rejected under 35 U.S.C. 103(a) as being unpatentable over Fedorkow et al. (U.S. 7,230,917) (hereinafter "Fedorkow") in view of Ellsworth et al. (U.S. 6,131,113) (hereinafter "Ellsworth") and in further view of Stiliadis et al. (U.S. 6,134,217) (hereinafter "Stiliadis").

Regarding claim **21**, *Fedorkow in view of Ellsworth* teaches the medium of claim **20**. *Fedorkow in view of Ellsworth* does not teach "determining the new enqueue slot according to a pre-sort deficit round robin queuing scheme".

However, *Stiliadis* teaches a method a system for packet scheduling using a circular queue where deficit round robin scheduling is utilized as spoken of on column 3, lines 33-38, as well as column 22, lines 29-35.

At the time of the invention, it would have been obvious to someone of ordinary skill in the art, given these references, to combine the deficit round robin scheduling teachings of *Stiliadis* with the teachings of *Fedorkow in view of Ellsworth* in order to provide an effective queuing scheme that allows for variable frame size as spoken of on column 3, lines 33-38 of *Stiliadis*.

Allowable Subject Matter

14. Claims **3-5, 13, and 14** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15. Claims **19 and 24** would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

16. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim **3**, *Fedorkow* teaches the method of claim **2**. *Fedorkow* also teaches buffer manager 1010 of Figure 10 that maintains a head pointer 1032 (points to enqueue slot) that is used to load data (queue element) in FIFO 1030 (circular queue having slots) as spoken of on column 15, lines 36-40.

Fedorkow as well as the other prior art of record does not teach "dropping the enqueue element, if the overflow condition would result from enqueuing the queue element into the new enqueue slot, and resetting the LES pointer to designate the old enqueue slot, if the overflow condition would result from enqueuing the queue element" in combination with the other limitations of claims **2 and 3**.

Regarding claims **4 and 5**, these claims are further limiting to claim **3** and are thus also allowable over the prior art of record.

Regarding claim **13**, *Fedorkow in view of Ellsworth* teaches the method of claim **9**. *Fedorkow in view of Ellsworth* as well as the other prior art of record does not teach

where executing the first check comprises determining whether the "claimed mathematical relationship" is true in combination with the limitations of claim **9**.

Regarding claim **14**, *Fedorkow in view of Ellsworth* teaches the method of claim **9**. *Fedorkow in view of Ellsworth* as well as the other prior art of record does not teach where a variable "M" is "equal to or greater than a maximum number of slots of the circular queue that may be enqueued with queue elements during a delay period for updating a dequeue counter" in combination with the limitations of claim **9**.

Regarding claim **19**, *Fedorkow in view of Ellsworth* teaches the medium of claim **18**. *Fedorkow* also teaches buffer manager 1010 of Figure 10 that maintains a head pointer 1032 (points to enqueue slot) that is used to load data (queue element) in FIFO 1030 (circular queue having slots) as spoken of on column 15, lines 36-40.

Fedorkow as well as the other prior art of record does not teach "dropping the second enqueue element, if the overflow condition would result from enqueuing the second queue element into the new enqueue slot, and resetting the LES pointer to designate the old enqueue slot, if the overflow condition would result from enqueuing the second queue element into the new enqueue slot" in combination with the other limitations of claims **18 and 19**.

Regarding claim **24**, *Fedorkow in view of Ellsworth* teaches the medium of claim **18**. *Fedorkow* as well as the other prior art of record does not teach where executing and re-executing the first check comparing the relative positions within the circular queue designated by the CDS pointer and the LES pointer comprises determining

whether the "claimed mathematical relationship" is true in combination with the limitations of claim **18**.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Dastidar et al. (U.S. 7,139,859), Swenson et al. (U.S. 7,272,672), Li et al. (U.S. 6,961,715), and Shefi et al. (U.S. 7,113,516) are other references considered pertinent to this application.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Moore, Jr. whose telephone number is (571) 272-3168. The examiner can normally be reached on Monday-Friday (7:30am - 4:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wing F. Chan can be reached at (571) 272-7493. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Michael J. Moore, Jr.
Examiner
Art Unit 2619